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# Television

**Magazine**

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REVIEWING THE LATEST IN IPTV PRODUCTS, TECHNOLOGIES AND APPLICATIONS

## Internet TV Systems

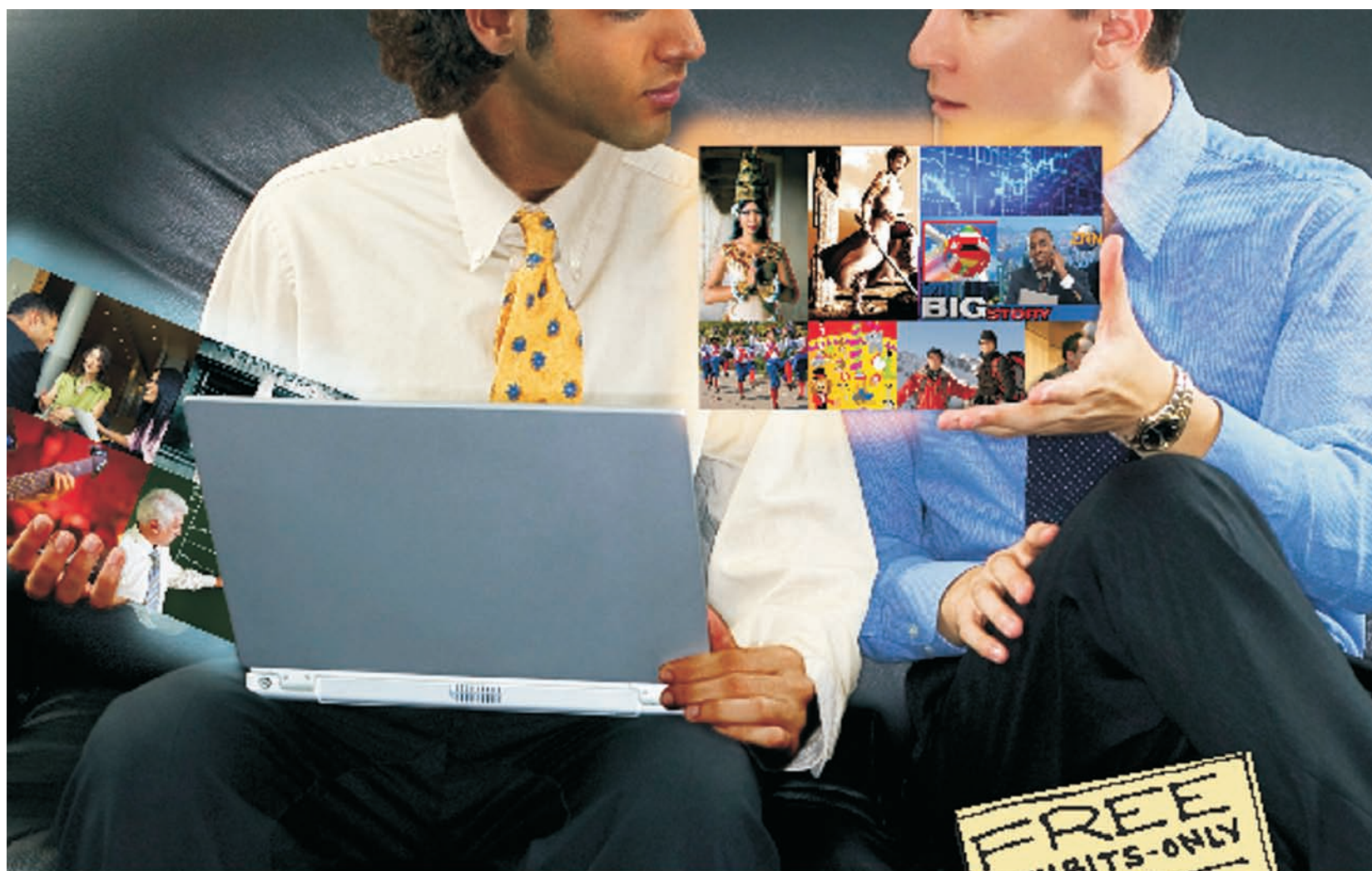
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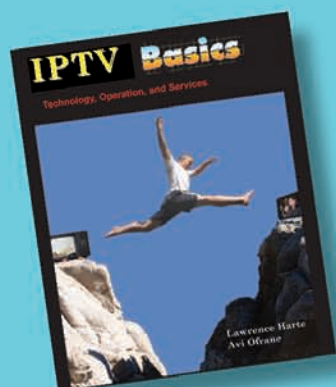
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## IP Television Basics

IP Television Basics: Technology, Operation, Economics, and Services provides an understanding of how IP television technology operates, what applications it can offer, the costs & benefits of packetized video systems, and the new services that can be provided by IP Television systems.

Authors: Harte, Flood  
384 pages, \$39.99

### Introduction to IP Television



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### Introduction to Mobile Video



Described are the key mobile video applications including sending video clips, live TV, video messaging and multi party gaming.

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Electronic subscriptions to IP Television Magazine are FREE. Printed versions of the magazine are distributed at industry trade events.

**IDENTIFICATION STATEMENT**

IP Television Magazine (ISSN: 1554-9410) is published monthly by Althos Publishing, 106 West Vance Street, Fuquay Varina, NC 27526 USA

**LIST RENTALS AND REPRINTS**

An Althos Publication  
106 West Vance Street,  
Fuquay Varina, NC 27526 USA  
1-919-557-2260 Fax 1-919-557-2261

FREE Subscription at [www.IPTVMagazine.com](http://www.IPTVMagazine.com)

## Editor's Viewpoint



When I first started publishing IPTV magazine, numerous companies informed me that TV through the public Internet would not work. I heard the same thing about telephone service through the Internet in the mid 1990's. The success of the company Vonage has proven that Internet telephone service works and the availability of AppleTV and NetFlix, as well as other over the top Internet TV services proves that Internet TV works. There are still looming issues for Internet TV, including bandwidth, security and the business model.

To get standard definition television quality, an average data rate of 700 kbps is needed and many broadband connections throughout the world provide at least 1 Mbps. In general, we are in a broadband war, which means that the trend for broadband carriers is to provide more bandwidth at the same or reduced cost. While it is possible that broadband providers may attempt to charge for streaming TV, their competitors are likely to use unlimited access as a sales tool, which means that broadband is not likely to be a key issue.

Another key issue with Internet TV is the use of good access controls and content protection. Without good verifiable security processes, content providers may not be willing to authorize the distribution of their content through Internet TV systems. There are companies that can provide systems that manage and enforce security controls which are recognized by content owners.

Possibly the biggest challenge for Internet TV is the business model. New entrants to the Internet TV industry have been providing access to content for free in hopes of developing a valuable subscriber base. Some companies, such as NeuLion, offer paid subscription models for specialty content. An important advertising business model needs to emerge for Internet TV. For this to happen, an Internet TV advertising clearinghouse network needs to be setup to allow for the dynamic selection and insertion of ads that are local to the viewing Internet TV STB.

**Internet TV - Watch it Work!**

**Lawrence Harte, Editor**

## IP Television Expert Writers

What makes a magazine successful is the value of its content. Our expert writers cover marketing, technology and business issues that are critical to the success of IP television systems and services.



**Robert Belt**  
Marketing

Mr. Belt is a new product business development, marketing and sales expert for communication products. Robert specializes in assisting international and OEM companies in finding, qualifying, establishing meetings, defining product requirements, negotiation of sales contracts and follow-up customer communication. He has more than 20 years of experience in product definition, engineering specification, design and contract negotiation for non-standard and new products. Mr. Belt has defined and located for strategic partnering, initiated discussions for technology partnering and drafted alliance agreements. Robert's clients have included Alps, Motorola, Nokia, Wavetek, Norand, Trimble, Mitsubishi, Panasonic, Fujitsu, Uniden, NEC, Qualcomm, Novatel, JRC, Apple, Omnipoint, NYNEX, Bell Atlantic, SONY and hundreds of other companies.



**Bud Bates**  
Technology

Regis (Bud) Bates is a wireless systems expert who specializes in network operations and planning for telecommunications and management information systems. As president of TC International Consulting, he performs Strategic Planning, Business Continuity Planning and Technology Innovation for his client companies. Mr. Bates has helped fortune 100-500 companies design, setup, and manage LANs and WANs using SONET, ATM, MPLS, and VPN architectures. He specializes in the setup of mobile communication systems and developing the processes necessary to ensure the reliable restoration of networks when failures occur. Bud is a sought after professional instructor and he teaches using both Instructor-led (ILT) and Virtual classroom learning (VCL) formats. Bud Bates authored over fifteen technology-oriented books, many of which were best sellers for McGraw-Hill. Bud received his degree in Business Management from Stonehill College (BS) in Easton, MA and completed an MBA in Finance at St. Joseph's University in Philadelphia (except the thesis).



**Lawrence Harte**  
Business

Mr. Harte has over 29 years of technology analysis, development, implementation, and business management experience. Mr. Harte has worked for leading companies including Ericsson/General Electric, Audiovox/Toshiba and Westinghouse and has consulted for hundreds of other companies. Mr. Harte continually researches, analyzes, and tests new communication technologies, applications, and services. He has authored over 100 books on communications technologies and business systems covering topics such as IP television, mobile telephone systems, data communications, voice over data networks, broadband, prepaid services, billing systems, sales, and Internet marketing. Mr. Harte holds many degrees and certificates including an Executive MBA from Wake Forest University (1995) and a BSET from the University of the State of New York, (1990).



**Roger McGarrahan**  
Content  
Licensing

Roger McGarrahan is co-founder and General Manager of PathFinder World Video LLC which licenses linear channel and VOD programming from ethnic and niche television networks to CATV, Telco IPTV, Broadband IPTV, Mobile and Hospitality television service providers. Prior to that Roger was CEO of Thomson Broadcast & Multimedia, Inc. (Thomson/Grass Valley) in charge of North America operations and previously its General Counsel. Earlier Roger was legal counsel for COMSAT RSI which specialized in the design and delivery of satellite communication systems. In total, Roger has twenty years experience as executive management, operations management, and corporate counsel in the broadcast, satellite and telecommunications industries.



**Michael Sommer**  
Consumer  
Electronics

Michael H. Sommer - The "Gadget Guy" Technology Commentator is a consumer electronics industry expert. Mr. Sommer regularly appears on several television stations as the Gadget Guy and is a sought after technology evaluation and marketing expert. His words and industry findings are referenced in many leading industry publications including USA Today, N.Y. Times and Telecom Business magazine. Mr. Sommer has been on the communication staff of the Winter Olympics and he is a staff expert writer for IP Television Magazine. He has been a consultant for hundreds of consumer electronics product developers ranging from high-tech start-ups to fortune 100 multinational companies. His clients include Motorola, Cendant Corporation, Sony, and other leading edge companies. Mr. Sommer attended the University of Hartford majoring in communications and he specializes in working with executives from fortune 1000 companies providing them with an understanding of consumer electronics device requirements and marketing programs.



**Eric Stasik**  
Patents &  
Legal

Mr. Eric Stasik is the director of Patent08, an expert consulting firm located in Stockholm, Sweden providing patent engineering, business development, and licensing services to small and medium-sized enterprises. He is an expert in helping firms develop patent and licensing strategies that support their business objectives. He is the author of several books on patent strategy and maintains a well-respected blog ([www.patent08.com](http://www.patent08.com)) on the business aspects of developments on patent law and practice. Mr. Stasik is an engineer; he is not an attorney at law and does not provide legal advice.



**Avi Ofrane**  
Billing  
Systems

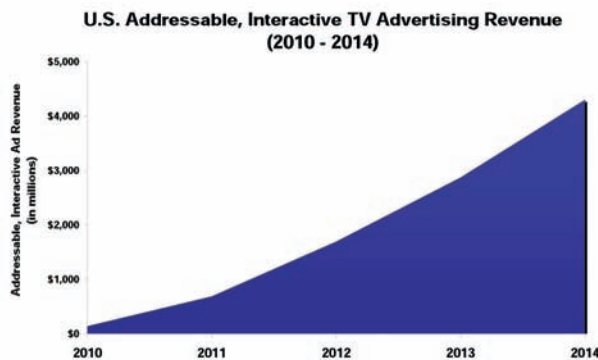
Avi Ofrane is the president and CEO, and a master instructor of The Billing College. Mr. Ofrane founded The Billing College in 1996 to address the converging market trends associated with telecommunications Billing and Customer Care. Mr. Ofrane began his career in 1977 as an analyst with the IBM Corporation, designing and implementing manufacturing systems. Throughout his extensive career, Mr. Ofrane has been involved in all aspects of the industry, including strategic planning, RFP processing, vendor evaluation and selection, business process engineering, business/systems analyses, project management, implementation, operations, quality assurance, and executive management. Since 1982, Mr. Ofrane has concentrated exclusively on the telecommunications industry, in which he is now a recognized expert and master instructor in Billing and Customer Care. Mr. Ofrane lectures extensively in the US and in Europe on Billing and Customer Care issues, strategies, methodologies, and practices and he is a frequent speaker at major industry conferences. He has authored several leading books on billing systems. Mr. Ofrane holds a BS, Computer Science, from Pennsylvania State University.

## Market Update

### Television Advertising Industry

According to the Television Bureau of Advertising, TV advertising revenue in the United States was approximately \$40.4 billion in 2009 which was a decline of 12.9% from the \$46.4 billion spent in 2008 [1]. TVB discussed in their press release that the 4th quarter of 2009 showed signs of recovery and predicted that there will be some advertising revenue gains in 2010.

Of the advertising spending that is allocated for television advertising, a shift is occurring in how the advertising funds are divided between traditional advertising and premium addressable and interactive advertising. The evolution of TV broadcasting is to provide more on demand content and the awareness of consumers to the benefits of



Source: Addressable, Interactive TV Advertising in the U.S., 2009 © 2010 Parks Associates

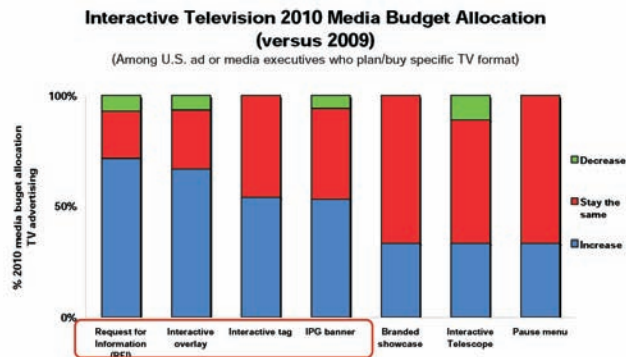
Advanced TV Advertising Spending Forecast  
Source: Parks Associates

VOD and DVR services will result in an increased use of advanced TV advertising. According to Parks Associates, by 2014, U.S. addressable, interactive TV advertising revenue will exceed \$4 billion, accounting for nearly 12% of total cable, DBS, and telco TV ad revenue.

Advanced TV advertising includes a mix of traditional addressable and new interactive ads formats such as request for information (RFI), overlay ads, interactive programming guide (IPG) banners, microsites, and ad telescoping that can be provided via VOD and DVR platforms.

Some of the key types of interactive advertising include requests for information (user data), interactive overlay, interactive tags, Interactive program guide (IPG) banner ads, branded showcases, interactive, and pause menus.

This figure shows the results of a survey of top level media executives on how their interactive ad spending mix is likely to change in 2010. This survey showed that RFI, interactive overlay, interactive tags, and IPG banners will likely increase in 2010.



Source: Advertising Outlook: Shifting Dollars, November 2009 © 2010 Parks Associates

Interactive TV 2010 Media Budgets  
Source: Parks Associates

#### References:

1. "Research Central, Ad Revenue Track, 2009 TV Ad Revenue Figures," television bureau of advertising, www.tvb.org.

Parks Associates is an internationally recognized market research and consulting company specializing in emerging consumer technology products and services. The company's expertise includes new media, digital entertainment and gaming, home networks, Internet and television services, digital health, mobile applications and services, consumer electronics, energy management, and home control systems and security.

For more information, go to [www.parksassociates.com](http://www.parksassociates.com)



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### CONNECTIONS™ EUROPE TOPICS:

- Advanced television services
- The residential gateway and the set-top box
- Consumer buying habits & service and product preferences
- Business models and opportunities
- Impact and market outlook for new technologies

Who will control content delivery to connected TVs?

How will the industry enable the free flow of content to multiple screens and handle management, monetization, and authorization?

How will consumers access, navigate, and interact with multiple sources of video content? Will 3D program guides be a reality?

What VAS will enter the video ecosystem, and what are the potential business models?

What business models will drive connectivity of mobile devices to the home network and content assets?

What mobile devices will join the connected home?

## KEYNOTE

**Benoit Joly**

Vice-President, Home Network & Applications

**Technicolor**

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## IPTV News



### NETGEAR Supercharges Home Theater Experience with New Class of WiFi Products to Support Internet-Enabled Set-top Boxes, TVs, Blu-ray Players and Gaming Consoles

HANNOVER, Germany - March 1, 2010 - NETGEAR®, Inc. announced two new networking accessories for home theaters. The High-Performance Wireless-N HD Home Theater Kit (WNHDB3004) is a carrier-grade, tested and proven solution for wirelessly playing multiple jitter-free 1080p HD video and audio streams to every room in the house flawlessly, and at double the performance and range of solutions in the market today. The Universal WiFi Internet Adapter

for Home Theater Devices and Gaming Consoles (WNCE2001) delivers Wireless-N performance of up to 300 Mbps through the Ethernet port of consumer electronic (CE) devices such as Internet TVs, game consoles, Blu-ray™ players and more.

A growing number of multimedia devices in the home theater are enabled with network connectivity, but oftentimes there is not a wired network connection available in the living room. While many of the available wireless solutions, either embedded or external, offer basic connectivity to the home network to play rich media to the HDTV, no other wireless solutions provide the reliability required for playing multiple, simultaneous, Blu-ray quality HD streams across multiple walls in a large home.

"Our High-Performance HD Home Theater Kit provides wired-equivalent connectivity and whole-home coverage using wireless," said Som Pal Choudhury, NETGEAR director of product marketing for Core Networking Products. "The technology is way ahead of the competition. With its groundbreaking speed, range and reliability, it is like WiFi on steroids."

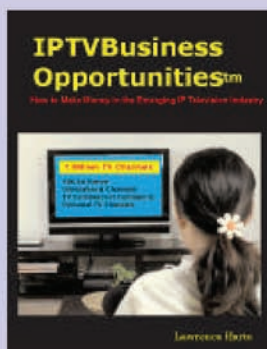
High-Performance Wireless-N HD Home Theater Kit (WNHDB3004)

With performance doubling that of competing products, the NETGEAR carrier-grade High-Performance Wireless-N HD Home

Theater Kit (WNHDB3004) delivers multiple, simultaneous, jitter-free 1080p HD video streams wirelessly throughout the home. It is the only solution that has been tested to provide sustained throughput of HD streams in excess of 40 Mbps 99.9 percent of the time, through multiple walls, throughout an above-average single family home.

The kit consists of a pair of two High-Performance Wireless-N HD Home Theater Adapters (WNHD3004). The set-up is truly plug and play - consumers simply plug the first adapter into the existing router or gateway, and the second adapter into any home theater device with an Ethernet port. The kit is pre-configured with security, so a single touch of a push-button securely connects additional adapters. IPTV customers and video enthusiasts can now wirelessly stream multiple 1080p HD streams with wired-equivalent reliability from the network, Internet or IPTV service provider to their home theater devices, including IPTV set-top boxes, Xbox® 360, PlayStation® 3, Wii™, Blu-ray players, Internet-enabled TVs, Apple® TV, NETGEAR Digital Entertainer products and more. The NETGEAR High-Performance Wireless-N HD Home Theater Kit supports point-to-multipoint HD video streaming and the multicast streaming protocol that IPTV service providers demand.

The High-Performance Wireless-N HD



### IPTV Business Opportunities™

by: Lawrence Harte

This book contains industry research and analysis that shows how to profit from IPTV. Services covered include new programming sources (specialty, international, ethnic), 10x ad revenue (addressable advertising), integrated television commerce (t-commerce) and supporting services (BSS and OSS).

ISBN: 1-932813-89-6

Price: \$34.99 print version \$29.99 eBook  
or Bundle Package(book and ebook) \$44.99!

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Home Theater Kit eliminates the need for expensive structured wiring or messy Ethernet cables. It is also designed to overcome the common problems - wireless signal strength, quality and reliability - associated with interference, frequently changing WiFi environments, and areas of the home that are notoriously difficult to reach. The kit combines 4x4 multiple-input, multiple-out (MIMO) antenna signal processing, real-time spectrum analysis and dynamic digital beam-forming with the industry's highest performance IEEE 802.11a/n 5GHz wireless LAN chipset, providing an unprecedented level of reliability and wireless performance in terms of data rates and range.

"With the rising demand among consumers for HD-quality video, IPTV service providers are increasingly looking for carrier-grade solutions to wirelessly connect IPTV set-top boxes to the home network," said Stephen Baker, vice president of industry analysis at The NPD Group, a leading market research company. "Likewise, VARs, resellers and system integrators specializing in home audio and video automation are looking for ways to cut costs in expensive cabling to connect their customers' whole home entertainment systems. Wireless devices that are capable of reliably playing multiple HD audio and video streams, like those of NETGEAR, are an ideal solution for the customers, as well as the service providers."

The Universal WiFi Internet Adapter (WNCE2001) for Home Theater Devices and Gaming Consoles

NETGEAR is also introducing the industry's first compact USB-powered Universal WiFi Internet Adapter (WNCE2001) that works with Internet TVs, game consoles and Blu-ray players. The first of its kind, the adapter is the only affordable solution in a small form factor that delivers optimal Wireless-N performance and works universally with any Ethernet-enabled CE device. This saves consumers from the confusion and expense of purchasing separate WiFi USB adapters for each CE device in their home theater.

The Universal WiFi Internet Adapter is powered by the USB port, avoiding the need for a long wire to the power outlet and making it more visually pleasing in the already congested home theater environment.



### Micrel's New Integrated Green Ethernet Switch-On-A-Chip Solutions Smallest 3-Port Switches In The World

San Jose, Calif., March 15, 2010 - Micrel, Inc. launched the KSZ8873/KSZ8863 series. The devices are highly integrated offering the industry's smallest footprint. They are designed to enable a new generation of low port count, cost-sensitive and power efficient 10/100Mbps switch systems. Lower power consumption, advanced power management schemes and sophisticated QoS features (including IPv6 priority classification) make these solutions ideal for IPTV, IP-STB, Voice-over-IP, media converter, automotive and industrial applications. Volume quantities are available now and samples can be ordered at: <http://www.micrel.com/ProductList.do>.

"The adoption of Ethernet connectivity in a broad range of consumer, automotive and industrial applications continues to accelerate," noted Dr. J.C. Lin, Micrel's vice president, Ethernet Products. "Micrel's new devices, featuring improved QoS capabilities, are highly power efficient, making them ideal for green Ethernet switch systems in these burgeoning markets."

The high integration of the KSZ8873 /KSZ8863 series includes an on-chip LDO and an internally generated clock for the

RMII interface - all of which reduce system cost and simplify system design. The interface configurations provided by the KSZ8873/KSZ8863 series, IEEE802.3-compliant transceiver interfaces and MII/RMII interfaces, enable the flexibility to meet the requirements of different applications. Enhanced QoS features, including traffic prioritization and source address filtering, facilitate implementation of advanced QoS policies in switch systems. The easy-to-use LinkMD® cable diagnostics support quick resolution of common cabling problems and reduce costly network downtime. Auto-MDI/MDIX eliminates the need for cross-over cable, thus reducing installation costs.



### Orange Launches Optolock-Enabled Fiber Optic Home Installations

Cork, Ireland --March 15, 2010 - Firecomms announced that its OptoLock transceiver is a key component of the home networking solution being deployed by Orange. A key brand of France Telecom, one of the world's leading telecommunications operators, Orange is deploying POF as the medium of choice in the home to reduce installation times, guarantee network reliability, and enhance customer satisfaction ratings.

Orange's OptoLock-enabled fiber optic kits offer a reliable home networking solution by allowing the distribution of a POF network throughout the house. The ready-to-install fiber optic kit enables Orange customers and installers to connect a TV or computer within a high-speed home network in just minutes,

minimizing the visual impact of the connection due to POF's ultra-thin diameter.

Orange has cited technical performance, simplicity of installation, and discreet design as benefits of the fiber optic kit. According to Orange field trial results, 98% of users expressed deep satisfaction with this innovative technology.

"This POF product offering by one of the largest telecommunications companies in the world demonstrates the overwhelming benefits of POF to operators and customers alike," says Hugh Hennessy, vice president of sales and marketing for Firecomms. "This deployment is one of many as operators and installers seek ways to overcome the disadvantages associated with traditional wired technologies."

The design of OptoLock enables the fiber to be cut and terminated to the exact required length on site, enabling even the most novice consumer to quickly and easily terminate the bare optical fiber. This means that OptoLock enables all the advantages of optical fiber to be brought into the home with do-it-yourself simplicity and costs. The benefits of this simple, robust high-speed interface will be significant as high-speed services like 100 Mb IPTV are delivered into the home.

Due to its ease of use, large core tolerances, and low costs, POF is enjoying substantial growth in home network and point-to-point interconnection. The annual worldwide POF market is estimated to be worth over \$2.5 billion in 2011, according to market research by Information Gatekeepers.



## devolo will showcase the new dLAN® generation with 500 Mbps at CeBIT 2010

devolo will showcase the new generation of dLAN® products at CeBIT 2010. Based on the forthcoming international powerline standard, IEEE P1901, the new dLAN® generation offers a transmission rate of 500 Mbps. devolo is also expanding the existing dLAN® AV range: in addition to the dLAN® 200 AV Wireless N adapter, which provides a simple way to add WLAN for powerline networks, the manufacturer will also showcase a smart solution for directly connecting USB devices - the dLAN® 200 AV USB Extender. The dLAN® TV Sat 1300-HD is another powerline innovation ready to be experienced. The first dLAN® set-top box for digital satellite television according to the DVB-S2 standard that is ready for series production uses the powerline for the distance between satellite antenna and set-top box and thus does not require a coaxial line.

devolo, the technological leader in the powerline market, will showcase its innova-

tive new dLAN® products at CeBIT 2010 (2 - 6 March 2010). The new dLAN® generation, which will be showcased live as part of an exclusive preview, will be at the centre of the trade fair activities at the devolo stand in Hall 15 (Stand D24) this year. The adapters, which are in compliance with the forthcoming international IEEE P1901 powerline standard, offer both higher transmission rates of 500 Mbps and a longer range. This allows, for example, up to four HDTV channels to be transmitted simultaneously via the home network. Backwards compatibility with the HomePlug AV standard allows consumers to use the new generation of dLAN® products together with dLAN® 200 AV adapters in a powerline network. With this new generation of products, the company also takes the FTTx efforts of Internet service providers into account, who are planning to make 100 Mbps broadband Internet available to European households via glass fibre in the near future. The first series products of the new dLAN® generation are scheduled for market launch in September 2010.

The dLAN® 200 AV Wireless N completes devolo's dLAN® 200 AV portfolio. The compact dLAN® adapter is equipped with internal WLAN antennas and enables consumers to set up WLAN zones quickly and easily for wireless surfing in the dLAN® network. Support of the fast WiFi N standard ensures that the full dLAN® bandwidth of 200 Mbps is used. In addition, the dLAN® 200 AV Wireless N has three Ethernet sockets and thus is the ideal product for operating multiple network-compatible devices on one dLAN® adapter. The dLAN® 200 AV USB



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Extender is a practical dLAN® addition, since the adapter features a USB port instead of an Ethernet interface. This way, USB devices such as printers, hard drives or webcams can easily be integrated into the dLAN® home network.

With the dLAN® TV Sat, devolo has introduced an innovative solution for easily distributing satellite TV signals which does not require a coaxial line for transmission. The dLAN® TV Sat 1300 HD receiver is the company's first set-top box that likewise does not require a coaxial line. An HDMI interface and digital output ensure the best transmission to the TV device and surround sound system. Yet, the dLAN® TV Sat 1300 HD is not just a DVB-S2 set-top box of the latest generation: It is also an EPG-supported video recorder. Consumers can easily use USB mass storage devices such as hard drives or memory sticks as storage media.

devolo is also presenting its current product portfolio at CeBIT. This includes the ultra-compact dLAN® 200 AVmini dLAN® adapter, which, with a depth of only 29 mm, can be used nearly anywhere. With its dLAN® 200 AVsmart+, the company is presenting at the fair in Hanover the first powerline adapter in the world with a "dLAN® screen", an LC status display for extreme simplification of network installation and monitoring. Via its integrated screen, the dLAN® 200 AVsmart+ offers comprehensive monitoring functions such as the display of the connection quality to other adapters in the powerline network. This is essential especially for networking consumer electronics devices.

"With the exclusive presentation of the new dLAN® generation, we want to show that dLAN® is the perfect backbone for home networking today and in the future," remarks Heiko Harbers, CEO of devolo AG. "By means of the international powerline standard, IEEE P1901, and our 3-year warranty, we offer retailers the security they will not easily find from other manufacturers." "In addition, we complete our dLAN® 200 AV product family with innovative devices such as the dLAN® 200 AV Wireless N and the

dLAN® 200 AV USB Extender," adds Harbers. "More and more people rely on dLAN® for their home network and are provided with a convenient solution to set up a WLAN zone in their house, for example, or to connect USB devices such as printers or hard drives directly to the dLAN® network."



### Altibox Deploys Full-Scale Agama Embedded Set-Top Box Monitoring

(LINKÖPING, March 16, 2010) - Agama Technologies announced that the Norwegian triple-play service provider Altibox (formerly Lyse Tele) has selected to commercially deploy a full-scale Agama Embedded Monitoring Solution in their set-top box population. The installation monitors both IPTV and VoD services, and enables Altibox to ensure the quality of experience with their substantial and growing subscriber base.

Continuous and real-time service monitoring inside the set-top box is today established as a key component in true end-to-end quality assurance for DTV services, four years after the first commercial deployment of Agama's Embedded Monitoring Solution. Efficient last mile and in-home monitoring requires a robust solution for collection, aggregation and presentation of monitoring data in a way that allows for scaling into virtually millions of STBs. The recent installa-

tion of the Agama Embedded Monitoring Solution at Altibox, starting at a quarter of a million STBs, serves as a working example of the scalability of the Agama solution to larger customer deployments.

"To be able to fully understand and work proactively with our service quality in different parts of our organization we need to have deep knowledge of the service delivery in the customer premises, and Agama proved to be the obvious choice for this task," says Jarle Johnsen, Head of IPTV Engineering at Altibox.

"With the introduction of Agama's Embedded Monitoring Solution we will be able to make both our NOC and customer care operations more effective, not to say significantly shorten our response times." "We are humble to the fact that yet another large-scale IPTV service provider opts for our solution as a cornerstone for their TV and VoD quality assurance processes," says Mikael Dahlgren, Managing Director at Agama Technologies. "Our strategy on in-STB monitoring to cover the last mile has from the very beginning been to provide an effective and highly scalable solution, and the deployment at Altibox proves our approach successful."

The Agama DTV Monitoring Solution is a complete line of products supporting operators to ensure TV service quality through the complete distribution chain, scalable to cover millions of STBs. Powered by Agamas unique multi-metric monitoring and presentation, the solution enables all parts of the operators' organization to take control of service quality - from NOC and customer care to management.

## TV Advertising Series

# Television Ad Technologies (Part 2 of 2)

## Program and Ad Insertion Verification

Ad insertion verification (insertion monitoring) is the gathering of information that confirms the dates and times while promotional messages are inserted into media services or programs. Ad insertion monitoring may be performed through the inclusion of subaudible tones or video components that can be detected and decoded by an ad monitoring receiver.

### *Subaudible Tones*

Subaudible tones are a range of frequencies below approximately 25 Hertz (cycles per second), which people may not be able to hear. Subaudible signals may be inserted into media programs (such as television programs or commercials) in the form of codes (sequences of tones or frequencies) that can be used to uniquely identify the ad.

The use of sub audible tones may allow for the detection of ad codes by other communication channels, which is known as cross channel detection. Some TV ad monitoring devices use audio to detect audio codes that identify TV programs (audience measurement devices).

### *Video Fingerprinting*

A video fingerprint is a unique set of characteristics and data associated with a particular video media file, transmission system or storage medium. Video fingerprints may be codes that are uniquely embedded in a media file, or they may be unique characteristics that can be identified in the storage or transmission medium, such as the particular variance of digital bits that are stored on a DVD.

Figure 3.10 shows how the insertion of TV ads may be verified by audio or video codes. This example shows that a hidden image code

### This article is Part 1 of a 9 Part Series

Advanced TV Advertising List	Month
Television Advertising	Jan 10
Television Ad Types	Feb 10
Television Advertising Technologies (Part 1 of 2)	Mar 10
<b>Television Advertising Technology (Part 2 of 2)</b>	<b>Apr 10</b>
Television Ad Campaigns	May 10
Television Ad Production	Jun 10
Television Ad Metrics	Jul 10
Television Advertising Economics	Aug 10
Television Ad Regulations	Sep 10

(data that cannot be detected by the viewer) has been inserted into the ad media. An ad detection device is located in an area that can receive the broadcasted ad and it can identify the insertion code. This ad monitoring device can then inform that advertiser that the ad has been inserted and when insertion took place. This information is returned back to the advertising agency for ad insertion verification reports.

## Ad Bookmarking

Ad bookmarking is the addition of information to an advertising message that allows it to be viewed at a later time. This may include an identity and classification code that can be used for sorting and viewing at a later time.

Social bookmarking (such as Digg, Stumbleupon) has been a tremendous success in the Internet world. Bookmarking seems to have the ability to generate substantial ad revenue, especially if ad viewers can refer the ad to their friends (ad viewing multiplier).

Because advertisers may benefit from additional ad views by receptive and interested viewers, they may be willing to pay additional fees when viewers return to watch the bookmarked ad.

### *Ad Bookmarks*

TV advertising bookmarks are codes or labels that allow viewers to identify (tag) specific advertising messages so they can be viewed at a

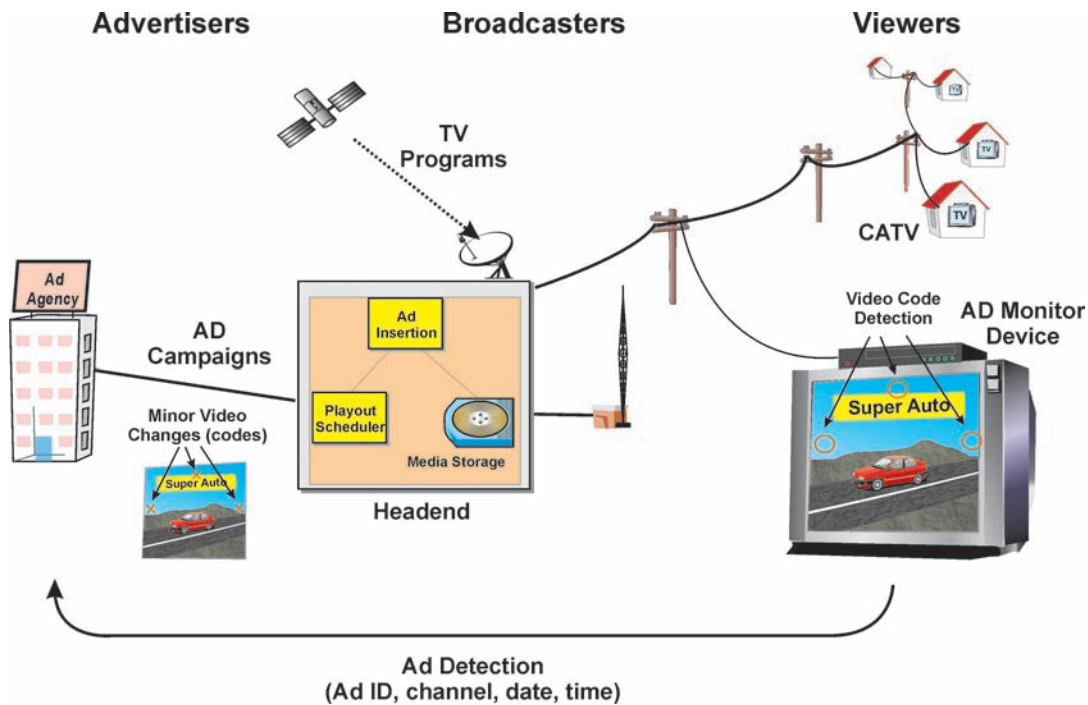


Figure 3.10, TV Ad Verification

later time, to obtain additional information about the product or service, or to refer the add to a friend (social bookmarking) option.

### Ad Rating

Ad rating is the evaluation of the characteristics of an advertising message by a person to provide an indication or value that indicates the likelihood of another person's interest in the ad.

### Ad Forwarding

Ad forwarding is the process of redirecting or retransmitting advertising messages that are received to one or more recipients. Ad forwarding is a form of viral marketing.

### Stored Ad Viewing

Bookmarked ads may be stored locally (such as in a DVR), on the TV system, or in other locations. When the viewer decides to view bookmarked ads, their viewing system must display the stored ads, allow them to select specific ads, and enable them to initiate the playing of

the ad. Bookmarked ads may be grouped or sorted according to criteria such as date saved or ad categories.

Figure 3.11 shows how a viewer may bookmark TV ads for later viewing. This viewer has selected to save a car ad for later viewing (bookmark this ad). When the viewer opts to see the saved ads, they can activate the saved commercial.

### TV Ad Coupons

TV advertising coupons are vouchers that are generated as a result of a TV viewer selecting a coupon option on their television display. To provide TV ad coupons, a TV commercial may be modified (enhanced) to include a graphic, which can be associated with offering more information by pressing a button on their remote control. The information may be provided by email or in other forms such as direct mail. If the viewer has registered a profile, the stored contact information can be used (displayed to confirm which viewer will receive the information).



Figure 3.11, Ad Bookmarking

### ***Download Coupon Graphic***

A download coupon graphic may be displayed prompting viewers that have STBs that are capable of displaying a graphic overlay (an icon) that informs the viewer that coupons are available. The download coupon graphic may be mapped to a button on the remote control that the viewer can use to request the coupons.

### ***Coupon Request Form***

A coupon request form identifies the coupons that are available to be sent, the name of the person requesting them, and the destination address of the recipient (such as an email address, telephone number for a text message coupon, or a postal mailing address). The viewer may be allowed to change the details of the recipient as the registered owner or the TV service may not be the person who is requesting the coupons.

### ***Coupon Delivery***

Coupon deliver is the method that is used to transfer coupon vouchers to a recipient. Coupon delivery options may include email, short messaging, fax and postal mail.

Figure 3.12 shows how a TV advertising message can be enhanced to offer a coupon. This example shows a coupon available icon and a select button to receive coupons. When this viewer presses the select button, a delivery confirmation screen is displayed showing the delivery address that will be used. The viewer is also given the option to change the delivery address and delivery method type.

### ***TV Ad Bidding***

TV ad bidding is the process of selecting threshold amounts that may be paid for the insertion of advertising messages. Ad bidding requires a bid management process that can monitor and adjust the bid amounts for the requested insertion and placement of ad messages. Bidding for TV advertising systems may allow advertisers or their agencies to bid for particular program or viewing segment types. For example, it may be possible to separately bid for different programs, locations and age groups.

### ***Bid Management***

Ad bidding systems dynamically allocate promotional ad opportunities to pre-approved advertising companies. Bid management systems can be used to automatically identify, authorize and optimize bidding for ad insertion opportunities.

One of the key advantages to using ad bidding networks for TV advertising is that it lowers the barrier to entry for advertisers. It makes TV advertising more like Internet advertising, which allows advertisers to setup their own ad campaigns and budgets. While the minimum TV ad bidding budget may be low, the actual ad spend per cpm is very high. Lower entry costs result in more advertisers, more competition, and higher ad revenues.

Another advantage of ad bidding networks is that they automatically coordinate the selection and placement of ads. Once the automation process is setup, it can dramatically reduce the management costs of an advertising system.





Figure 3.12, TV AD Coupon System

### **Reporting**

Reporting for ad bidding systems include identifying bids that were accepted, the amounts of winning bids, and the total cost for the advertising program during the selected interval or other filter options. Reporting may also provide additional details such as viewer interactions (channel changing) during the advertising period.

Figure 3.13 shows how TV ad bidding may work for selling cars. This diagram shows that bidding for advertising messages may occur for particular age groups, income ranges, program types and geographic regions. This example shows that TV advertisers may bid for ads that may appear on a variety of programs throughout various geographic regions. The advertiser sets the maximum bid they are willing to offer and a maximum number of impressions may be selected to ensure advertising budgets can be maintained. This example shows that the advertiser may also have the ability to select if the same ad will be sent to the same person more than one time.

### **TV Viewer Skin Ads**

TV viewer skin ads are promotional messages that appear in the area surrounding the media player window. TV viewer skins ads may be displayed to viewers who are watching the TV channel on a multimedia computer (window viewing).

### **Window Viewing**

Some broadcasters simulcast their programming on channels through the Internet, which can be watched using a media player on a multimedia computer.

### **Player Skin Ads**

Player skin ads are promotional messages or images that appear in the area surrounding the viewer's media player window. Skin ads may be associated with segments of content (scenes), allowing the ads to change throughout the viewing of the program. For example, if the program is about cars, ads for car wax may show when a scene shows the car in a car wash, and ads for oil may be shown if the car's engine explodes.

Figure 3.14 shows player skin ads that are displayed in an area around the viewer's media player window. This example shows skin ads that are contextually matched to the media automotive program that the person is watching. The ads displayed around the viewing window are for automotive parts and services.

Ad Name	Age Group	Income Range	Program Type	Regions	Ad Repeats	Bid per Impression	Max Impressions
Utility Vehicle	25-39	70k+	Sports	Nationwide	Yes	0.10	10,000
Status Auto	40-54	Any	Entertainment	Nationwide	No	0.18	20,000
Luxury Car	55-69	70k+	Travel	Florida	Yes	0.07	10,000

Figure 3.13, TV Ad Bidding

## User Controlled Advertising

User controlled advertising is a promotional media delivery system that can select and deliver ads to viewers according to their preferences and sensitivities to viewing advertising messages

### Advertising Controls

Advertising controls are a set of rules and settings (parameters) that can be used to coordinate the selection of ads and when they are presented to the viewer. Advertising controls can interact with viewer advertising profiles to select more desired or appropriate ads for the viewer.

## Advertising Profiles

Advertising profiles are particular implementations of ad reception and category preferences that can be used to select and deliver promotional messages to recipients. Viewers may setup their advertising profiles to define their advertising preferences such as the amount of ads, when ads are played and the category of promotional messages.

### Content Provisioning

Content provisioning is the process of setting up authorizations and systems for delivery of content. A user controlled advertising system may be able to dynamically authorize content that can be viewed based on the amount of advertising the viewer has previously watched.

Figure 3.15 shows how a user controlled advertising system can



Figure 3.14, TV Player Skin Ads

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Figure 3.15, User Controlled Advertising

work. In this example, the viewer creates an advertising profile. When advertising spots are presented to this viewer, the advertising system reviews the profile and selects ads that best match the interests of the viewer.

## Enhanced Television (ETV)

Enhanced television is the sending of additional data or signals along with broadcast media that can enhance the viewing experience. ETV applications may use but not require a return channel to confirm the reception or interaction with the ETV programs. ETV systems are composed of ETV applications (short software programs), control messages (signaling), media timing (synchronization), media sources (streams and graphic objects), and application servers (for interactive applications).

### *ETV Applications*

ETV applications are software programs that are designed to control the media presentation within a program. The types of ETV applications range from simple graphics overlay controls to interactive navigation systems.

### *Application Control Signaling*

Application control signaling is the process of sending commands and status messages that can be used to monitor and control the presentation of media programs.

### *Media Synchronization*

Media synchronization is the process of adjusting the relative timing of media information (such as time aligning audio and video media). Media synchronization typically involves sending timing references in each media stream that can be used to align and adjust the relative timing of multiple media signals.

ETV systems provide timing references (time coded signals) to control time related events. ETV programs use a media timeline to identify when events should occur over a time period.

### *Application Server (AS)*

An application server is composed of a computer and associated software that is connected to a communication network to provide information services (applications) for clients (users). Application servers are usually optimized to provide specific applications such as database information access or sales contact management. ETV systems may

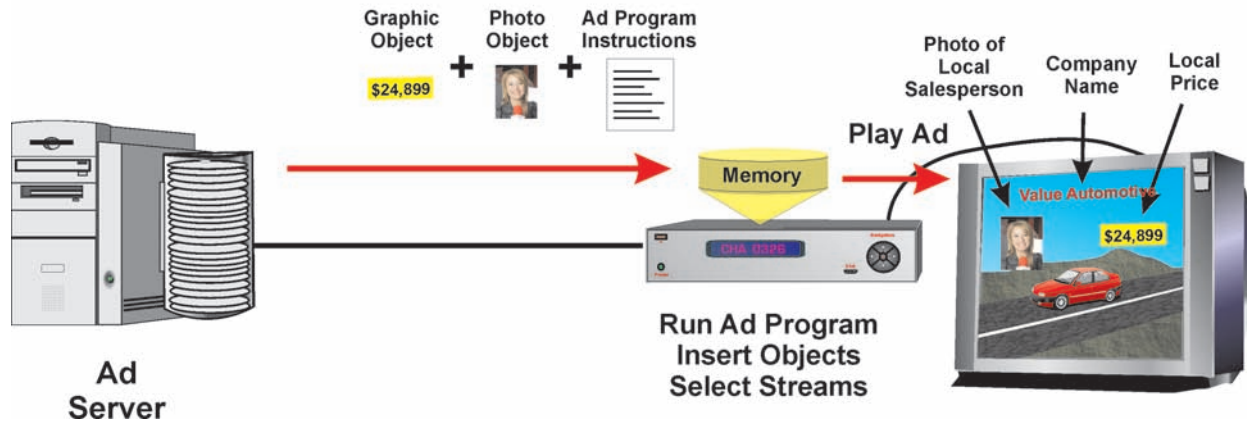


Figure 3.16, Enhanced Television

use application servers to provide interactive services to viewers (such as media requests and content delivery).

Figure 3.16 shows how television content may be enhanced with other media or programs that allow for interactive actions. This example shows that an ETV application is composed of the original content plus additional content, application software, and control signaling information. Program enhancements may be developed by the content creator, the content network provider, or at other locations within the distribution of content to its recipients.

ETV systems require the user's system to perform actions on behalf of the viewer (user agents). ETV user agents coordinate how ETV programs are presented to viewers and the ways that the user can interact with the content (ETV events).

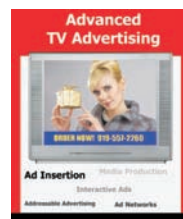
### ***ETV User Agent***

An enhanced TV user agent is a software application that can run on or with a user's communication device (such as a TV set top box) to receive and process commands and instructions. ETV programs must be able to determine if the user has an ETV user agent that is able to perform the program enhancements. There are different types of receiving devices (such as set top boxes and web enable televisions) and user agent software programs may have different versions and capabilities.

### ***ETV Events***

An enhanced television event is an action that enhances or alters the presentation experience of a television program. ETV events can include content source redirection, launching an ETV application program, or any other media processing occurrence. ETV events may be scheduled to occur when certain conditions exist (such as when the user selects a button on their remote control) or during specific time periods.

Figure 3.17 shows some of the key parts that may be used in an enhanced television program. This example shows that the key parts include TV application programs (software modules), signaling messages, stream events, a media timeline, and an application server. Application programs are sets of processing instructions that are sent or associated with the enhanced media program. Signaling messages may be provided that detect actions and control which media sources (stream events) are selected. An application server may exchange commands and content with the user's device to allow for advanced services. The ETV user agent interacts with each of these components to control how the program is presented to the user and how each component part may be selected and processed.



Article Source:  
**Advanced TV Advertising**  
 \$34.99 printed  
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## Featured Article

# The Cost of an Over-the-Top IPTV System

By: Roger McGarrahan, Pathfinder Digital

A lot has been said recently about Over the Top IPTV (OTT IPTV) and the opportunities it provides content owners to distribute their programming directly to their viewers. Potential business models are as simple as single networks looking to "narrowcast" their niche content to their loyal subscribers; often as a substitute for broadcasting via satellite (Direct-to-Home). Other business models are as ambitious as television service providers wishing to deploy complete packages in competition with traditional Cable, Telco and Satellite operators. But many potential OTT IPTV operators are struggling to understand what components are required to launch, and just as importantly, what the cost will be. This article provides guidance.

In order to understand the cost you must first understand the basic elements of an OTT IPTV system. There are of course many possible options that a system may or may not include, but the basic elements are:

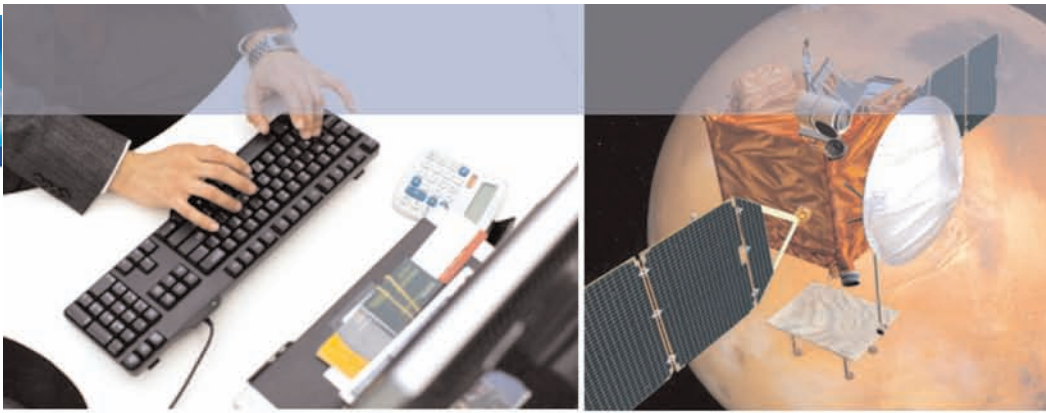
1. Content
2. Ingest of the linear channel and VOD content
3. Encoding
4. Middleware (Content Management System, Subscriber Management System)
5. Billing System
6. DRM System (optional)
7. Content Delivery Network
8. Set Top Boxes

You should note that as I discuss costs, I will refer to what I believe to be the lowest likely cost for each component. It is very important to understand the lowest cost does not necessarily indicate the best value. As with most things, you tend to get what you pay for. So while you can purchase a piece of electronic equipment for \$500, you may decide it is a better value to purchase a different piece of equipment for \$1000 because it has more features, is more robust, or simply performs better. The pricing I discuss is intended to provide you an understanding of the minimum investment required to launch an OTT IPTV system, but it may be in your best interest to spend significantly more depending on your application.

It all starts with content. You might be looking to distribute content you produce or you might intend to license content from third parties. Either way, there are costs involved. The most economical approach is to simply use OTT IPTV as a means to further the distribution of content that you already own or license. This is done by many ethnic and religious broadcasters. However, if you want to increase your chances of drawing a significant subscriber base, you will need to offer a more complete package. This applies to niche programming as well as mainstream programming. If you have a Russian language network, you will obtain more subscribers by offering a bundle of 10-20 Russian channels than you will by offering your signal channel.

There are many that envision OTT IPTV as one day being able to compete with traditional Cable/Telco/Satellite as the primary source for people to obtain their programming. The fact that many set top boxes, such as the PeerStation 340, which can receive and play over the air (terrestrial) television signals, and therefore receive the major networks programming free of charge, lends support to this theory. However others note that most "cable networks" are not available for license on OTT IPTV systems and it will, therefore, be very difficult to convince viewers to abandon their 600 cable channels in place of receiving the major networks and a selection of niche programming. (Although I'm talking to more and more people who find that option





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appealing.) Regardless of who is right, you certainly want to provide the most compelling channel line-up possible. Vivicast has been working for years to assemble a bouquet of network programming that can be licensed for distribution over OTT IPTV systems. And as OTT IPTV becomes more popular and better understood, their list of available channels is certain to grow.

The price of licensing rights varies dramatically depending on the network and the content. Some will allow the content to be distributed for free. Some will charge only pennies per subscriber per month, and others may ask for a revenue split, taking the majority of the fee. The best approach is to identify the content you want and start making phone calls.

The first step in the work flow is the ingest of the content into the OTT system. There are two primary ways to accomplish this. Often the simplest method is to simply downlink the signal off of satellite if it is available. This requires a satellite dish/LNB pointing to the satellite being downlinked. If the signals are being broadcast on different satellites, multiple dishes may be required. Jordan Technical Services will provide and install a dish/LNB for under \$3,000. Note that multiple signals can be downlinked off of the same dish if they originate from the same satellite; which is often the case. In addition to the dish/LNB, a satellite receiver for each channel will also be necessary. Having spares receivers for each channel is also a good practice. Coship makes good quality receivers that cost as low as \$500.

If the channel is not being broadcast on satellite, you don't have the space for an antenna farm, or you simply don't want to incur the cost to downlink, an alternative is to simply receive the signal from the source via broadband. To do this an encoder will need to be configured to push the signal to your head-end/CDN. The encoder is then installed at the signal source (the broadcaster's studio). One encoder is required for each channel being streamed. The network must have a dedicated broadband connection large enough to reliably transport the stream(s).

Ingesting VOD content is usually much simpler. Many middleware systems provide the operator a webpage where the content file, the trailer file, and the poster art can simply be uploaded to the server. It is akin to uploading a file to an email. These files will usually have to be pre-configured to meet the specifications of the system (WM9, h.264, etc.). However, the uploading of the files and their placement on the system are usually quite easy.

If the linear channel was ingested using the broadband method discussed above, then it is already encoded and ready for broadcast. If the satellite downlink method was used, then it probably is being played out of the receiver in baseband and needs to be re-encoded as

an MPEG-4 stream. If multiple channels are being encoded, then a multiple chassis encoder system is needed such as Visionary Solutions' AVN420 SD h.264 encoder blades installed in their Media Processing Platform rackmount chassis. As 17 encoder blades can be installed in Visionary Solutions' one chassis, the cost per channel decreases.

With the content ingested, the next requirement is a middleware system to manage where the content is broadcast. Middleware is in essence the brains of the system and has multiple functions. For starters, the middleware provides the graphic user interfaces (GUI) for the subscriber to navigate through the system. The GUI tells the subscriber what the channels are, when they are being played (Electronic Program Guide), allows for channel and VOD selection, purchases of Pay Per View content, and occasionally DVR or Trick Play capabilities. The middleware is also the vehicle that insures the right content (linear or VOD) is played to the correct set top box when the subscriber requests it (the Content Management System). The middle-

ware also insures that set top boxes only receive the content that the subscriber is authorized to view (the Subscriber Management System). Additionally the middleware tracks information about the subscriber's use of the system, purchases made, and billings due and provides that information to the billing system.

Middleware systems can be very complex and very expensive. Many of the largest players have competed for dominance as middleware providers and have produced very impressive products that have equally impressive price tags (as in \$Millions). However for OTT IPTV applications, more modest and cost effective options are available. PeerTV offers a feature rich middleware system that costs less than \$60,000 installed which includes licenses for five thousand Set Top

**“Regardless of who is right, you certainly want to provide the most compelling channel line-up possible.”**

*-Roger McGarahan*

Boxes.

Now may be a good time to note that networks can launch their channel(s) on an OTT IPTV platform without having to purchase their own middleware platform. Companies like PathFinder TV and NeuLion will launch a network on their middleware platform for a fraction of the cost to establish a standalone system. Costs can be as low as \$4,000 at launch for hardware and \$1,500 a month per channel plus the CDN costs and the set top boxes (discussed below).

Unless the OTT service is free, some form of billing system will be necessary to enable the operator to correctly bill its subscribers. The options here are numerous. Often operators will simply interface to whatever billing system they are currently using. The middleware usually provides "hooks" (points of interface) that provides the billing system the information it needs.

Having a reliable digital rights management (DRM) system in place is a requirement of major studios and cable networks. DRM sys-





tems often require an initial investment of \$20,000 or more depending on the number of channels for the system (linear and VOD encryption) and then an additional license of \$3 to \$7 per STB. However many OTT IPTV applications are intended for the narrowcast market; niche content such as ethnic and faith based programming. And a lot of these networks do not require a DRM system.

Perhaps the biggest surprise to want-to-be OTT IPTV operators is the cost of, or even the need for, the content delivery network (CDN). Yes, you can stream a linear channel from your home or office to your friend and the quality is fine, but try streaming 100,000, 1,000 or maybe even 10 streams and you'll find yourself out of bandwidth very soon. To deliver all of those streams to your subscribers you are going to need the help of professionals; the CDNs. CDNs have massive broadband pipes and co-location servers around the world that allow them to distribute very large amounts of data (like television streams) reliably to very large numbers of subscribers. How to calculate the amount of bandwidth you will require and the best approach to "purchasing" capacity with a CDN could be the topic of an entire article (maybe next time). But for now just realize that the cost of delivering your content through a CDN could be your largest operational cost. The good news is that the more capacity you purchase, the lower your cost per subscriber is going to be. I have found that CDN costs (the servers and the bandwidth) tend to range from a high of \$6 per subscriber per month when there are very few subscribers, to as low as a couple of dollars per month per subscriber when there are many subscribers in your system (assuming a 1Mbps stream). So when you are considering the launch of an OTT IPTV service, be sure to keep the CDN costs in mind.

For your subscriber to receive the service, they will need a set top box (STB). As with other electronic devices, the cost of STBs varies greatly depending on the features the STBs offer. Beyond features, what is most important is whether the STB has been configured, and field tested, to work with the rest of your system. People often make the mistake of believing that any STB with the right specifications will

work. They are often profoundly disappointed later to find out that all the components that worked together on paper don't play well in the real world. The internet is complicated, and streaming video in an OTT IPTV application is tricky. So, select a STB that has been developed specifically for the application you are using and the way you are using it (encoder, streaming server, middleware, DRM, etc.). Unless you are extremely confident in your ability to manage the integration of all these components, look to experienced integrators or turn-key offerings to ensure a successful launch.

My advice is to purchase a STB that has a WiFi kit as an option. Most people don't keep their television next to their router, so WiFi is a preferred alternative to running an Ethernet cable across the house. I also like STBs that have at least a couple of Gigs of flash memory. This will allow for buffering of content and a better experience for the viewer.

STBs can be purchased for under \$100, but beware. These STBs may simply be platforms upon which a system can be developed and integrated, but they may not be a complete and integrated Set Top Box solution. Developing your own OTT system can be elegant and effective, but it can also be a nightmare. As mentioned above, I prefer solutions that have been fully integrated and field tested. Choosing to purchase fully integrated STBs tends to put you in the \$100 to \$200 range depending on quantity. Large discounts are usually available for volume purchases.

As a final item, don't forget about your other operating costs. You will need a place to host your headend that sits on fiber so that you can deliver the channels to the CDN. You should also have a backup for your broadband connection (such as via satellite) so service is not interrupted should the landline connection go down. UPS systems and generators are also required should there be a power outage at the headend. Additionally, you will need space and personnel to manage the logistics of configuring, shipping and servicing STBs for your subscribers. You can be sure that your viewers will have questions so you will need a system in place to answer their support calls. These may be activities you manage yourself, or you may contract third parties to provide these services for you. Either way, be aware of the associated costs.

So is OTT IPTV cheap? No. A significant investment is required to properly launch and operate even a basic OTT IPTV system. However OTT can be significantly less expensive than distributing content on other platforms such as satellite. Also, OTT IPTV is more scalable than satellite; you can start small and let your costs grow only as your subscriber base grows.

What is certain is that OTT IPTV capabilities and popularity will continue to grow. Good luck with your launch!

## Featured Article

# Android for TV Set Top Boxes - True Media Integration

By: Lawrence Harte

Did you know that Android™ is changing how we watch television? In January 2010, MIPS Technologies and its partners introduced the world to the first television set top box and other consumer electronic devices that use the Android operating system. The use of Android in TV set top boxes can mean dramatic changes in how we receive and interact with TV systems.

### What is Android?

Android is an open source operating system (free) that has multitasking capability and has been standardized and is overseen by Google.

### Open Source Programs

While the Android operating system was owned by Google, it is now available as open source through the Open Handset Alliance (OHA). This means that companies can obtain the original programming instructions for the software so they can enhance its capabilities.

### Multitasking Operating System

Android was originally created for mobile devices, which require a reliable multitasking operating system. As a multitasking operating system, Android can control critical resources such as memory allocation and the assignment of background applications. This can be a critical feature for television set top boxes which consumers expect to operate in a reliable way.

### Standardized System

Historically the embedded Linux operating system was fragmented without a consistent set of programming application programming interfaces (APIs) and libraries. The Android operating system relies on the Linux kernel but also provides a well defined and documented structure and set of APIs. This allows equipment providers and soft-

ware developers to rely on key functions and features that are offered by Android.

### What Kind of Devices can Use Android?

The Android operating system can be used in almost all types of consumer electronic devices including set top boxes, Blu-ray disk players, digital televisions, portable computers, and voice over internet protocol (VoIP) telephone systems. Android is a great fit for any device that has a screen and an interactive user interface.

### Android Television Set Top Boxes

The world's first Android based television set top boxes were demonstrated at the 2010 International CES show in January. Both Western MediaBridge and KDDI R&D Labs. Inc., demonstrated Android set top boxes using MIPS-Based SMP8654 media processors from Sigma Designs. The picture below shows the KDDI Research Labs prototype Android TV STB.



Source: MIPS Technologies



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The Western MediaBridge Android TV set top box features video on demand services, has digital rights management (DRM) capability, includes office type software applications (word processor, spreadsheet, and presentation), integrated web browser, and has ability to use multiple types of controls including TV remotes and wireless keyboard interfaces. The STB can also display multiple formats of video up to 1080p video quality.

## ***Android Netbook Computers***

The Android operating system can also be used in portable computing devices such as netbook computers.

This picture shows the Lemote YeeLoong8089 netbook computer running Android and using the MIPS-Based Loongson processor, with browser capability and other software applications. Users of this netbook do not need to purchase an operating system and they are ready to start browsing the web when they receive their computer.



Source: Lemote

## ***Android Home Media Centers***

Home media centers allow users to view, distribute, and store media programs (such as TV programming) and content (music, photos, and videos). Home media centers allow consumers to search, discover, categorize and enjoy online media content directly from a TV, and to communicate and simplify how they can share with their friends and family.

This photo shows the Home Jinni ConnectTV social media center for embedded platforms leveraging Android. In addition to the capabilities described above, the Home Jinni platform allows users to share content through social media networks, access content from any online source, such as YouTube, and enables users to share content across devices in their homes. The ConnectTV platform was developed by Home Jinni on a MIPS-Based processor from Sigma Designs.



Source: MIPS Technologies

## **Why is Android Important**

The Android operating system offers significant cost reduction, new applications, and integration advantages for manufacturers of consumer media devices.

### ***Reduced Licensing Cost***

Commercial operating systems, while generally stable, are tested and have support, commonly require a per unit royalty fee which can be expensive. Because the core Android operating system is open source, there are no license or royalty fees required.



### ***Reduced Development Costs***

There can be tens of thousands of lines of software code instructions used in an operating system. The cost to develop, test, and debug can be extensive. When a manufacturer chooses to use Android, the development cost can be much lower (and development time can be much shorter). Companies like MIPS Technologies and its partners offer unique Android development tools to speed design and debug. This is evidenced by the fact that several companies developed production-quality products with Android on MIPS—starting in August 2009 when MIPS released its code to open source and finishing by CES in January 2010.

### ***Available Applications***

It has been said that people do not buy devices or computers, they buy the benefits or applications they offer. For Android to be successful, it must have applications that people want and Android already has many available applications.

To ensure Android had many available applications when it was released, Google hosted a \$10 million application developer challenge contest to encourage companies to develop applications (some developers received \$15k to \$150k for their applications). As a result, by 2010 there were approximately 10,000 applications available for Android when it was initially released to the public. These applications were originally developed for mobile handsets, but many can be directly usable by products in the digital living room in the form of widgets. For example, a Facebook application on a mobile phone may run unmodified on a TV set top box.

Android applications that are fully optimized for the large screens of today's HDTVs will soon follow. There are already support groups for Android. Some of these groups are associated with Google and others that are completely independent of Google.

### ***Android Extensions***

Because the Android operating system was originally developed for mobile handsets, there are some functions and capabilities that must be added to enable Android to operate with other types of consumer devices such as televisions and personal computers. These include full 1080p HD capability, hardware accelerators, multichannel audio, and customizable user interfaces—among many other technologies. MIPS Technologies and other member companies of the Open Embedded Software Foundation (OESF) <http://www.oesf.jp/en/> are taking a leading role in driving these changes.

Additional devices that contained these enhancements and others were also shown at the 2010 International Consumer Electronics Show.

### ***Hardware Video Accelerators***

Android was initially developed for mobile devices which had small screens and only required a limited amount of video processing capability that was typically handled in software. When it is used in TV devices, the ability to decode full HD video will be performed in hardware (video decoders). MIPS and its partners enhanced Android to be able to take advantage of these hardware accelerators.

### ***Multichannel Audio***

The original Android operating system was primarily targeted at supporting music and portable video through headphones and thus only supported two channels of audio (stereo). TV broadcast systems may transmit in multiple channels of audio (surround sound), which will require additional audio capabilities to be added to Android.

### ***Customizable User Interfaces***

Android was also developed for a very personal user experience on a smartphone. For a compelling user experience on the TV, the user interface must be developed with the "10-foot" remote control user experience in mind. TV broadcasters and device manufacturers are also likely to want to customize their Android interface to the consumer (branding). This means that the user interface must be able to provide TV menus, browser, photo applications, home music and video media management (DLNA), and other device applications (widgets).

MIPS Technologies, Inc. (Nasdaq: MIPS) is a leading provider of industry-standard processor architectures and cores that power some of the world's most popular products for the home entertainment, communications, networking and portable multimedia markets.

For more information, contact (408) 530-5000 or visit [www.mips.com](http://www.mips.com).

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# Internet TV Systems

Internet TV systems are the combinations of equipment, software, and processes that are used to gather programs from various sources, organize them into channels, distribute them through the public Internet, and allow people to select and view the programs on one or more types of viewing devices. Internet TV systems allow people or companies to manage their own TV stations. Internet TV stations hosts may have requirements on content and services that their clients can offer. Internet TV systems must allow for the creation of scheduled programming (TV channels). Internet TV systems may be software based (a hosted Internet TV service), hardware devices and software that connect to the Internet, or a combination of both. Some Internet TV systems can work with set top boxes (convert the Internet connection to a TV signal without a computer). Internet TV systems may require viewers to register or subscribe (free or fee based) before they can get access to the Internet TV channels.

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by Lawrence Harte

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## Editorial Calendar

Month Deadline/ Submission	Special Editorial Focus	Featured Articles	Buyers Guide	Trade Show Participation
<b>January 10</b> 12/29/09 1/5/10	<b>Internet TV STB</b>	Internet TV Station Viewer Ad Profiles	<b>IPTV Channel Hosts</b>	CES Future TV Show NTCA Blackhat
<b>February 10</b> 1/26/10 2/4/10	<b>TV Widgets</b>	TV Widget Consortiums Screening UGC	<b>TV Widget Developers</b>	Digital Switchover Strategies
<b>March 10</b> 2/26/10 3/3/10	<b>Shared Middleware</b>	IPTV System Sharing	<b>IPTV Middleware</b>	IPTV World Forum Carriers World
<b>April 10</b> 3/25/10 4/2/10	<b>Internet TV Broadcasting</b>	Adding Internet TV to IPTV Systems	<b>Internet TV Systems</b>	NAB MiPTV Interop
<b>May 10</b> 4/24/10 5/1/10	<b>Home Media Networking</b>	Home Media Network Standards	<b>IP STBs</b>	NCTA Digital Hollywood
<b>June 10</b> 5/23/10 5/30/10	<b>IPTV Customer Care</b>	Automating Customer Care	<b>IPTV Customer Care Systems</b>	Broadcast Asia
<b>July 10</b> 6/23/10 6/30/10	<b>Virtual Headends</b>	Virtual Headend Options	<b>Virtual Headend Systems</b>	Blackhat SIGGRAPH
<b>August 10</b> 7/21/10 7/28/10	<b>TV Content Licensing</b>	TV Content Licensing Strategy	<b>Content Licensing Agents</b>	
<b>September 10</b> 8/18/10 8/25/10	<b>TV Program Guides</b>	TV Program Guide Data	<b>TV Metadata Management Systems</b>	IBC
<b>October 10</b> 9/19/10 9/26/10	<b>Multiplatform Advertising</b>	Adapting TV Ad Delivery	<b>Ad Delivery Systems</b>	Supercomm NECA Interop Broadcast India
<b>November 10</b> 10/18/10 10/25/10	<b>TV Ad Monitoring</b>	TV Advertising Metrics	<b>TV Ad Validation Systems</b>	Interop Telco TV
<b>December 10</b> 11/18/10 11/25/10	<b>Broadband TV Quality</b>	Managing Quality on Internet TV	<b>Internet TV Testing Equipment</b>	

# P|A|T|H|FINDER BroadbandTV

**Your low cost OTT IPTV alternative.  
PathFinder Broadband TV provides Content Owners  
and Networks a low cost End-to-End IPTV Solution.**

Want to offer video directly to your viewers at reasonable costs?  
PathFinder Digital and its partners provide Networks and Operators a robust Over-the-Top IPTV application for content distribution.



**Visit us in Peer TV's Booth  
(C9530) or  
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(SU5902)**

PathFinder Digital and its partners provide complete systems or specific components to fit your application including:

- PeerTV MX3.0 Gateway inclusive of Content Management System, Subscriber Management System, billing and CAS interface
- Visionary Solutions AVN420 h.264 SD encoders
- PeerTV 340 Set Top Boxes with remote and WiFi, 2G Flash, 160G HDD options
- CDN third-party services
- System integration, set-up, install, commissioning, and support